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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/574,592	11/20/2006	Robert Seth Hartshorne	57,0534 US PCT	3968
370/3 7590 06/08/2009 SCHLUMBERGER-DOLL RESEARCH ATTN: INTELLECTUAL PROPERTY LAW DEPARTMENT P.O. BOX 425045 CAMBRIDGE, MA 02142				
EXAMINER				
LI, AIQUN				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/574,592

**Applicant(s)**

HARTSHORNE ET AL.

**Examiner**

AIQUN LI

**Art Unit**

4151

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-46 is/are pending in the application.
- 4a) Of the above claim(s) 1-23 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 24-46 is/are rejected.
- 7) ☒ Claim(s) 32-33 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SF/ICE)  
Paper No(s)/Mail Date 12/18/2008
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_

## **DETAILED ACTION**

### ***Priority***

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.
2. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d).

### ***Claim Objections***

3. Claim 32 is objected to because of the following informalities: claim 32 recites "stabilising" in line 6, which appears to be a misspelling of the word "stabilizing". Appropriate correction is required.
4. Claims 32 and 33 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.
5. Note that claim 24, recites "an anionic surfactant" in line 2. Claim 32, which depends on claim 24, recites "the surfactant is ... a quaternary ammonium compound" in line 9 and 10; Claim 33, which depends on claim 24, recites "the surfactant is ....N-erucyl-N, N-bis (2-hydroxyethyl)-N-methyl ammonium chloride in line 6-7. Both quaternary ammonium compound and N-erucyl-N, N-bis (2-hydroxyethyl)-N-methyl ammonium chloride are cationic surfactants. Therefore claims 32 and 33 fail to further limit claim 24.

***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 24-31, 34-40, 42, 43, 45 and 46 are rejected under 35 U.S.C. 102(b) as being anticipated by Whalen (US Patent No. 6035936).

8. Regarding claim 24, Whalen teaches a viscoelastic surfactant fluid for fracturing subterranean formations (col.3, line 5-10) comprising:

an anionic surfactant (col.3, line 8; col.4, line 14) to provide a viscosity high enough to achieve the desired degree of fracturing of the formation (col.5, line 30-35), which reads on an anionic surfactant for forming a viscoelastic gel;

a hydrophobic organic alcohol that is immiscible with water (col.4, line 19), which reads on the hydrophilic-lipophilic organic compound;

an aqueous medium that can be both fresh and salt water (col.4, line 15 and 26), and the salt water is preferably about 1 wt% to about 4 wt.% based on the total weight of salt and water (col.5, line 61-62 and 65-67), which is equivalent to a salt concentration of 0 (fresh water) to 4 wt%, which overlaps with the claimed range of 0 to less than 1.0 wt%.

9. Regarding claim 25, Whalen teaches the organic alcohol is immiscible with water (col.4, line 19), which reads on the claim.

10. Regarding claim 26, Whalen teaches the organic compound is organic alcohols (col.4, line 19 and col.5, line 50-60), which is non-ionic, which reads on the claim.
11. Regarding claim 27, Whalen teaches the organic compounds are organic alcohols such as ethanol, 2-propanol, 1-octanol, 2-octanol(col.5, line 56, 58), which reads on the claimed compounds composed of a linear carbon chain comprising one polar groups; 2-ethyl-1-hexanol (col.5, line 59), which reads on the claimed compounds composed of a branched carbon chain comprising one polar groups; ethylbenzyl alcohol(col.5, line 57), which reads on the claimed compounds composed of a partially unsaturated carbon chain comprising one polar groups.
12. Regarding claim 28, Whalen teaches the organic compound is organic alcohol (col.4, line 19 and col.5, line 50-60), which has a polar -OH group, which reads on the claimed -OH polar groups.
13. Regarding claim 29, Whalen teaches the organic alcohol is propanol alcohol ethers (col.5, line 57), which reads on the claimed ether group.
14. Regarding claim 30, Whalen teaches the organic alcohol is ethanol, 2-propanol, 2-ethyl-1-hexanol, 1-octanol and 2-octanol (col.5, line 55-60), which reads on the claimed mono-alcohol; a diethanol (col.5, line 57), which reads on the claimed diol.
15. Regarding claim 31, Whalen teaches the organic alcohol is 2-propanol or 1-octanol (col.5, line 58), which reads on the claimed propan-2-ol and octan-1-ol.
16. Regarding claim 34, Whalen teaches 2-ethyl-1-hexanol alcohol is present at a ratio equal to 20% by volume of the surfactant mixture ( Example 1, col.7, line 27), wherein the anionic surfactant dodecylbenzene sulfonic acid (sodium salt) is present at

60% by volume (Example 1, col.7, line 15-16), which is equivalent to a molar ratio of the organic compound to anionic surfactant at 0.72, calculated by the examiner based on the molecular weight of 2-ethyl-1-hexanol (130.23g/mol) and Dodecylbenzene sulfonic acid (sodium salt) (348.5g/mol), and density of 2-ethyl-1-hexanol(0.833g/cm<sup>3</sup>), Dodecylbenzene sulfonic acid (sodium salt) (1.03 g/cm<sup>3</sup>), which reads on the claimed molar ratio.

17. Regarding claims 35-38, Whalen discloses the viscosity of the fluid has a viscosity range of 175 cp to 218 cp at 100 s-1 at 66 degree of Celsius (Example I, col.7, line 38), which reads on the claimed viscosity and temperature.

18. Regarding claim 39, Whalen teaches 2-ethyl-1-hexanol alcohol is present at a ratio equal to 20% by volume of the surfactant mixture ( Example 1, col.7, line 27), wherein the anionic surfactant dodecylbenzene sulfonic acid (sodium salt) is present at 60% by volume (Example 1, col.7, line 15-16), which is equivalent to a molar ratio of the organic compound to anionic surfactant at 0.72, calculated by the examiner based on the molecular weight of 2-ethyl-1-hexanol (130.23g/mol) and Dodecylbenzene sulfonic acid (sodium salt) (348.5g/mol), and density of 2-ethyl-1-hexanol(0.833g/cm<sup>3</sup>), Dodecylbenzene sulfonic acid (sodium salt) (1.03 g/cm<sup>3</sup>), which reads on the claimed molar ratio. Whalen further discloses the viscosity of the fluid has a viscosity range of 175 cp to 218 cp at 100s-1 at 66 degree of Celsius (Example I, col.7, line 38), which reads on the claimed viscosity and temperature.

19. Regarding claim 40, Whalen teaches the salt is inorganic salt (col.5, line 61-62 and claim 13), which reads on the claim.

20. Regarding claim 42, Whalen teaches the fluid is a fracturing fluid (Abstract, col.3, line 6), which reads on the claim.
21. Regarding claim 43, Whalen teaches a method of fracturing a subterranean well formation comprising providing a viscoelastic surfactant fracturing fluid and pumping the fluid into a subterranean formation (claim 1), which reads on the claim.
22. Regarding claim 45, Whalen teaches a viscoelastic surfactant fluid for fracturing subterranean formations (col.3, line 5-10) comprising an anionic surfactant (col.3, line 8; col.4, line 14) to provide a viscosity high enough to achieve the desired degree of fracturing of the formation (col.5, line 30-35), which reads on an anionic surfactant for forming a viscoelastic gel; an organic alcohol such as propanol alcohol ethers (col.5, line 57), which reads on the claimed organic alcohol with ether group; and one water soluble salt from about 1 wt% to about 4 wt.% based on the total weight of salt and water (col.5, line 61-62 and 65-67), which reads on the claimed range.
23. Regarding claim 46, Whalen teaches a fracturing fluid which are stable at elevated temperatures (col.3, line 1-2) with high viscosity (col.4, line 30-32) comprising one or more surfactants (col.3, line 7). The fluid can be further stabilized, and their viscosity increased by the addition of organic alcohols (col.5, line 50-53), which reads on the claim.
24. Claims 24-33, 41-45 are rejected under 35 U.S.C. 102(b) as being anticipated by Zhou (WO02/064946A1).
25. Regarding claim 24, 42- 45, Zhou teaches an aqueous viscoelastic gel (page 8, line 19) for use as a fracturing fluid (page 1, line 4-6) fluid comprising a viscoelastic

surfactant (page 8, line 29-30) that may be cationic, anionic or zwitterionic (page 9, line 9-10), which reads on the claimed surfactant; and an amphiphilic surfactant (page 4, line 32-33) such as ester carboxylates (page 11, line 31), reverse and forward amide carboxylates (page 11, line 34-35), or alcohols (page 18, line 7, Example 1) such as isopropanol (page 18, line 8), butanol (page 19, line 11), ethylene glycol (page 19, line 19), oleyl alcohol (page 19, line 19), which reads on the claimed hydrophilic-lipophilic organic compounds with one or more polar groups; and the fluid may comprise inorganic salts present in concentrations of 1 to 10 wt% (page 18, line 5), which is equivalent to 0 (when there is no salt) to 10 wt%, which encompasses the claimed concentration.

26. Regarding claims 25-28, 30 and 31, Zhou teaches the fluid comprises alcohols (page 18, line 7, Example 1) such as isopropanol (page 18, line 8), butanol (page 19, line 11), ethylene glycol (page 19, line 19), oleyl alcohol (page 19, line 19), which are mono -alcohols miscible with the formulation; non-ionic; composed of a linear or branched saturated or partially unsaturated carbon chain; and contains polar -OH groups.

27. Regarding claims 25 and 29, Zhou teaches the fluid comprises amphiphilic (page 4, line 32-33) ester carboxylates (page 11, line 31), reverse and forward amide carboxylates (page 11, line 34-35), which is miscible with the formulation and contains amide or ester groups.

28. Regarding claims 32 and 33, Zhou teaches the surfactant is monocarboxylate such as oleate, or di- or oligomeric carboxylates (page 10, line 29-31); a compound



of the formulae R-X-Y-Z (page 9, line 35 and page 10, line 1), where R is the hydrophobic tail of the surfactant (page 10, line 4), Z is the hydrophilic head group of the surfactant which can be  $-\text{SO}_3^-$ ,  $-\text{COO}^-$  (page 10, line 12), X is an acetal, amide ether or ester bond (page 10, line 7-8), which reads on the disclosed stabilizing group, Y is a spacer group which is constituted by a short saturated or partially saturated hydrocarbon chain of n carbon atoms where n is at least equal to 1, preferably 2 and, when n is  $\geq 3$ , it may be a straight or branched alkyl chain (page 10, line 8-12), which reads on the claimed Y; N-erucyl-N, N-bis (2-hydroxyethyl)-N-methyl ammonium chloride (page 10, line 20-21).

29. Regarding claims 40 and 41, Zhou teaches the fluid may comprise salts (page 18, line 2) including inorganic salts or organic salts (page 18, line 2-7), which reads on the claims.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to AIQUN LI whose telephone number is (571)270-7736. The examiner can normally be reached on Monday -Thursday, 9:00 am - 6:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Angela Ortiz can be reached on (571)2721206. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/AL/

***/Angela Ortiz/  
Supervisory Patent Examiner, Art Unit 4151***